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US EPA Approval Signature

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Date

Ms. Christine Clark  
Regional Sample Control Center  
U.S. EPA Region I  
11 Technology Drive  
North Chelmsford, Massachusetts 01863

November 21, 2002

RE: TO No. 9, Task No. 2, TDF No. 421  
Connecticut River Fish Tissue Study  
Environmental Research Institute (ERI), UCONN  
Pesticides/PCB Congeners Analyses

Pesticides/PCB Congeners:

44/ Fish Tissue/	CT-BT-FC01 to CT-BT-FC05, CT1-SMB-FC01 to CT1-SMB-FC05, CT2-SMB-FC01 to CT2-SMB-FC05, CT3-SB-FI01 to CT3-SB-FI04, CT3-SMB-FC01 to CT3-SMB-FC05, CT4-SMB-FC01 to CT4-SMB-FC05, CT5-SMB-FC01 to CT5-SMB-FC05, CT6-SMB-FC01 to CT6-SMB-FC05, CT7-SMB-FC01 to CT7-SMB-FC05
5/Aqueous Equipment Blanks/	Rinsate Blk (Phase I) (8/7/00), Rinsate Blk (Phase II) (8/7/00), Phase I (Blank) (10/23/00), Phase II (Blank) (10/23/00), Phase I Blank (11/1/00)
1/Tissue SRM/	SRM 1945 "Organics in Whale Blubber" obtained from NOAA/NMFS NIST

Dear Ms. Clark:

A Tier III data validation was performed on the organic analytical data for 44 tissue samples and one tissue SRM. The five aqueous equipment blanks were not validated since the associated raw data were not available from the laboratory. The tissue samples were collected by the following state agencies: CTDEP, MADEP, NHDES with USFWS, and VTDEC for the NEIWPC and the U.S. EPA in the Connecticut River. The samples were analyzed according to the NOAA Technical Memorandum NOS ORCA 130 (modified method) and ERI's laboratory SOP for the Analysis of Pesticides and PCB Congeners in Tissue Samples. The samples were validated according to the NOAA Technical Memorandum NOS ORCA 130 (modified method), ERI's laboratory SOP for the Analysis of Pesticides and PCB Congeners in Tissue Samples, and criteria in the Connecticut River Fish Tissue Study Quality Assurance Project Plan (QAPP), April 6, 2000; defaulting next to Region I, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses, December 1996 criteria, and finally to EPA Region I's Environmental Services Assistance Team Organic Data Validation SOP ESAT-01-0082 (1/31/01).

The data were evaluated based on the following parameters:

- Overall Evaluation of Data and Potential Usability Issues
- Data Completeness (CSF Audit - Tier I)
- \* ● Preservation and Technical Holding Times
- PE Samples/Accuracy Check
- GC/ECD Instrument Performance Check
- Initial Calibration and Continuing Calibration Verification
- \* ● Blanks
- \* ● Surrogate Analytes
- \* ● Analyte Identification
- Matrix Spike/Matrix Spike Duplicate
- NA ● Laboratory and Field Duplicates
- NA ● Instrument Sensitivity Check
- Sample Quantitation
- System Performance

\* - All criteria were met for this parameter.

NA - Not applicable.

**The following information was used to generate the Data Validation Memorandum attachments:**

Table I: Recommendation Summary Table - summarizes validation recommendations

Table II: Overall Evaluation of Data - summarizes Site DQOs and potential usability issues

Data Summary Tables - summarize accepted, qualified, and rejected data

**Overall Evaluation of Data and Potential Usability Issues**

The following is a summary of the site DQOs:

- To perform a watershed-wide fish tissue monitoring program which will document current conditions with regard to contaminant concentrations of representative fish species from the mainstem of the Connecticut River. This information will enable states to revise human health risk assessments and will provide a basis for trend analysis when subsequent sampling is performed by monitoring teams.

One Standard Reference Material sample (SRM 1945 "Organics in Whale Blubber") obtained from NOAA/NMFS NIST (intercomparison exercise) was analyzed for this project. Sixteen out of the 30 spiked compounds with certified values had recoveries within established acceptance limits. For the compounds that are outside QC limits, five (hexachlorobenzene, PCB 52, PCB 105, PCB 138, PCB 195) were recovered outside the lower limit and nine (o,p'-DDT, o,p'-DDE, p,p'-DDE, o,p'-DDD, oxychlordan, mirex, PCB 180, PCB 206, PCB 209) were recovered above the upper limit. The analytes that do not meet criteria are qualified accordingly for all samples.

The five rinsate blanks sampled on 8/7/00, 10/23/00, and 11/1/00 are not validated since associated raw data for the rinsate blanks and supporting laboratory benchsheet documentation were not supplied by the laboratory.

The laboratory was unable to recover the compounds hexachlorobenzene, oxychlordan, o,p'-DDE, trans-nonachlor, o,p'-DDT, cis-nonachlor, endosulfan II, and mirex in the matrix spike samples. All endosulfan II and mirex results are non-detected and are rejected (R). All non-detected hexachlorobenzene results are rejected (R) except for sample CT3-SB-FI02 which is estimated (J). All non-detected o,p'-DDE results are rejected (R) except for sample CT3-SB-FI04 which is estimated (J). Oxychlordan, trans-Nonachlor, o,p'-DDT, and cis-Nonachlor results in the samples are mixed with non-detects and positive detects. For these compounds, non-detects are rejected (R) and positive detects are estimated (J).

For the compounds that were not recovered in the matrix spike samples, all compounds were recovered in the SRM with the exception of endosulfan II which was not a spiked compound in the SRM. However, all of these compounds were outside QC limits in the SRM except for trans-nonachlor and cis-nonachlor. Hexachlorobenzene recovered below the lower QC limit and oxychlordan, o,p'-DDE, o,p'-DDT, and mirex recovered above the upper QC limit.

It is noted that the NIST/NOAA intercomparison exercise SRM was analyzed with some of the samples for this project but was not extracted along with any of them. The SRM was extracted some time before 9/29/00, which was the date the laboratory reported results to NIST for evaluation, while the samples were extracted from 8/17/00 to 11/15/00. Inspection of the sample extraction logs do not show the SRM to be extracted with them. Therefore, the matrix spike results are more accurate indicators of the laboratory's method performance.

Data validation identified the data quality issues which required qualification or rejection of specific results. The rejected (R) data cannot be used for the site objectives. The remaining data are qualified as estimated (J). Estimated data are often used in human health risk assessments. All the spiked surrogate compounds had percent recoveries within their acceptable ranges which supports the use of the J qualified data for the site objectives. Acceptable quality control results which support the use of the qualified data include holding times, available initial calibrations, continuing calibration verifications, and pesticide degradation checks. The majority of matrix spike compounds percent recoveries were within acceptable ranges and there were only minor exceedences in the continuing calibration verifications.

### **Data Completeness**

The following data or information in the data package had discrepancies and/or were missing and were requested from the laboratory:

1. A copy of the analytical method NOAA ORCA 130.

2. Tabulation of the initial calibration and continuing calibration Response Factors, %RSD, %D, and %Breakdowns were not submitted for any of the associated calibration standards.
3. Tabulation of the internal and cleanup standard % recoveries were not submitted for any of the associated samples and QC.
4. Tabulation of results and data files were not submitted for any of the associated Rinse Blanks, instrument blanks, or SRMs.
5. A copy of the laboratory's analytical SOP and/or an itemization of the modifications applied to method NOAA ORCA 130.
6. For the analytical sequence T001127.s, the initial calibration data were not submitted on the electronic data CD. According to the instrument run log, the file names are P112703.d through P112707.d. Submit the missing information as hardcopy or electronic data.
7. The data file T022624.d from the analytical sequence T010226.s did not have an associated quant results file. Only a raw unlabeled chromatogram could be generated. Provide the missing quant report file, either hardcopy or electronic file.
8. The raw result (quant report concentration) cannot be reproduced by the validator. Provide an example calculation for the quant report value, for each column, using a relevant sample.
9. The laboratory reported "ND" for all non-detected analytes in each sample. Provide the sample specific detection limits for all non-detected results for each sample.
10. Clarify the procedure and criteria used to establish retention time windows for analytes.
11. Clarify the procedure used to determine which value (from which column) was reported for a detected analyte.
12. The MS/MSD %Recoveries reported do not appear to have the native amount present in the sample subtracted prior to calculating recovery. Verify the recoveries and resubmit corrected forms if necessary.

Items 1 through 4 were requested from the laboratory via the TOPO on 2/12/02. Items 5 through 12 were requested from the laboratory via the TOPO on 8/9/02.

Item 1 was adequately addressed on 6/6/02. Item 2 was adequately addressed on 4/15/02. Item 3 was adequately addressed on 3/19/02. Item 4 was adequately addressed on 7/16/02. Items 5 and

12 were adequately addressed on 9/27/02. Items 6, 7, 10, and 11 were adequately addressed on 8/29/02. Item 8 was adequately addressed on 10/1/02. Item 9 was adequately addressed on 8/19/02.

### **PE Samples/Accuracy Check**

One Standard Reference Material sample (SRM 1945 "Organics in Whale Blubber") obtained from NOAA/NMFS NIST (intercomparison exercise) was analyzed for this project. Sixteen out of the 30 spiked compounds with certified values had recoveries within established acceptance limits.

It is noted that the NIST/NOAA intercomparison exercise SRM was analyzed with some of the samples for this project but was not extracted along with any of them. The SRM was extracted some time before 9/29/00, which was the date the laboratory reported results to the NIST for evaluation, while the samples were extracted from 8/17/00 to 11/15/00. Inspection of the sample extraction logs do not show the SRM to be extracted with them. Therefore, the matrix spike results are more accurate indicators of the laboratory's method performance.

The following table summarizes the pesticide/PCB compounds that failed to meet the QC limits.

Compound	Value (ng/g)	QC limits (ng/g)	Action		Affected Samples
			Positive Detects	NDs	
o, p'-DDT	122	106 ± 14	J	A	All
o, p'-DDE	15.0	12.3 ± 0.87	J	A	All
p, p'-DDE	533	445 ± 37	J	A	All
o, p'-DDD	24.5	18.1 ± 2.8	J	A	All
Hexachlorobenzene	26.7	32.9 ± 1.7	J	UJ	All
Oxychlorodane	21.9	19.8 ± 1.9	J	A	All
Mirex	28.7	18.9 ± 2.8	J	A	All
PCB 52	38.6	43.6 ± 2.5	J	UJ	All
PCB 105	25.0	30.1 ± 2.3	J	UJ	All
PCB 138	123	131.5 ± 7.4	J	UJ	All
PCB 180	116	107 ± 5.3	J	A	All
PCB 195	12.3	17.7 ± 4.3	J	UJ	All
PCB 206	34.1	31.1 ± 2.7	J	A	All
PCB 209	15.4	11 ± 1.1	J	A	All

### **Instrument Performance Check**

Percent breakdown results and initial calibration results are not available for analytical sequence T0913.s due to a computer error at the laboratory. Please see initial calibration section.

### **Initial Calibration**

Percent breakdown and initial calibration results are not available for review by the validator for analytical sequence T0913.s due to a computer error at the laboratory. Professional judgment is used to take no action for the missing information since associated continuing calibration verification standards results are available. The associated samples CT3-SMB-FC01, CT3-SMB-FC02, CT3-SMB-FC04, and CT3-SMB-FC05 are estimated (J, UJ) for affected noncompliant analytes in the associated continuing calibration verification standards.

The laboratory inadvertently analyzed the low standard at 5.0 ng/mL in all eight initial calibrations instead of 2.5 ng/mL (indicated on the raw data) as required by ERI's laboratory *SOP for Analysis of Pesticides and PCB Congeners in Tissue Samples*. The validator increased sample specific quantitation limits for all samples accordingly. This does not adversely affect the results and it is noted that sample quantitation limits are below the project action limits.

### **Continuing Calibration Verification**

The following table summarizes the Continuing Calibration Verification (CCV) results which do not meet the Connecticut River Fish Tissue Study Quality Assurance Project Plan (QAPP), April 6, 2000 criterion of 80%-120% and the resulting sample qualifications:

CCV	Date/ Time	Instr.	Column	Compound	%Rec.	Action		Samples Affected
						Positive Detects	NDs	
P091343	9/15/00 01:15	GC11	1	Heptachlor	125	J	UJ	CT3-SMB-FC01 CT3-SMB-FC02 CT3-SMB-FC04 CT3-SMB-FC05
			2	Heptachlor	130	J	UJ	
			2	Dieldrin	121	J	UJ	
			2	o, p'-DDD	122	J	UJ	
			1	Endrin	138	J	UJ	
			2	Endrin	154	J	UJ	
			1	Methoxychlor	123	J	UJ	

CCV	Date/ Time	Instr.	Column	Compound	%Rec.	Action		Samples Affected
						Positive Detects	NDs	
P091352a	9/15/00 09:38	GC11	1	Heptachlor	123	J	UJ	CT3-SMB-FC01 CT3-SMB-FC02 CT3-SMB-FC04 CT3-SMB-FC05
			2	Heptachlor	124	J	UJ	
			1	Heptachlor epoxide	66	J	UJ	
			1	Endrin	128	J	UJ	
			2	Endrin	141	J	UJ	
P091353	9/15/00 10:27	GC11	1	PCB 195	76	J	UJ	CT3-SMB-FC01 CT3-SMB-FC02 CT3-SMB-FC04 CT3-SMB-FC05
			2	PCB 195	79	J	UJ	
			1	PCB 170	79	J	UJ	
P110831	11/9/00 21:10	GCECD	2	Methoxychlor	121	J	UJ	CT1-SMB-FC01 to CT1- SMB-FC05 CT2-SMB-FC03 CT2-SMB-FC04
P110852	11/10/00 20:10	GCECD	2	Heptachlor	128	J	UJ	CT2-SMB-FC03 CT2-SMB-FC04 CT3-SMB-FC03
			2	gamma- Chlordane	48	J	UJ	
			1	Endrin	136	J	UJ	
			2	Endrin	140	J	UJ	
			1	Methoxychlor	128	J	UJ	
			2	Methoxychlor	134	J	UJ	
			2	PCB 126	123	J	UJ	
P110873	11/11/00 19:11	GCECD	2	gamma- Chlordane	49	J	UJ	CT3-SMB-FC03
			1	Methoxychlor	128	J	UJ	
			2	Methoxychlor	132	J	UJ	
P111790	11/21/00 15:33	GCECD	2	gamma- Chlordane	44	J	UJ	CT2-SMB-FC01 CT2-SMB-FC02 CT2-SMB-FC05
			2	Endosulfan II	162	J	UJ	
P112750	11/29/00 19:23	GCECD	2	p, p'-DDT	124	J	UJ	CT5-SMB-FC01 to CT5- SMB-FC05 CT4-SMB-FC01 to CT4- SMB-FC05

CCV	Date/ Time	Instr.	Column	Compound	%Rec.	Action		Samples Affected
						Positive Detects	NDs	
P112771	11/30/00 17:40	GCECD	2	p, p'-DDT	121	J	UJ	CT4-SMB-FC01 to CT4-SMB-FC05
P120455	12/6/00 22:05	GCECD	2	Heptachlor	121	J	UJ	CT7-SMB-FC01 CT7-SMB-FC02 CT7-SMB-FC03 CT7-SMB-FC05
			2	Endrin	121	J	UJ	
			2	p, p'-DDT	122	J	UJ	
			1	Methoxychlor	125	J	UJ	
			2	Methoxychlor	125	J	UJ	
P120466	12/7/00 09:44	GCECD	2	o, p'-DDT	121	J	UJ	CT7-SMB-FC01 CT7-SMB-FC02 CT7-SMB-FC03 CT7-SMB-FC05
			2	Endosulfan II	174	J	UJ	
			1	Methoxychlor	124	J	UJ	
			2	Methoxychlor	127	J	UJ	
			1	PCB 126	123	J	UJ	
T120780	12/11/00 01:25	GCECD	1	Heptachlor epoxide	129	J	UJ	CT-BT-FC01 to CT-BT-FC05
T120794	12/11/00 16:29	GCECD	1	Heptachlor epoxide	126	J	UJ	CT-BT-FC01 to CT-BT-FC05
T022617	2/27/01 01:34	GCECD	2	o, p'-DDT	77	J	UJ	CT7-SMB-FC04
			2	Endrin aldehyde	122	J	UJ	

The data associated with the noncompliant continuing calibration verification results are estimated (J, UJ) due to the recoveries outside acceptance range. The quantitation of the associated analytes in the samples could be biased.

#### **Matrix Spike/Matrix Spike Duplicate**

Seven MS/MSD pairs were evaluated for this SDG: CT-BT-FC04 MS/MSD, CT2-SMB-FC01 MS/MSD, CT3-SB-FI02 MS/MSD, CT3-SB-FI03 MS/MSD, CT4-SMB-FC04 MS/MSD, CT5-SMB-FC01 MS/MSD, CT7-SMB-FC04 MS/MSD.

The tables below summarize the MS/MSD results which do not meet the recovery criteria of 30-130% and/or RPD  $\leq$  40% as specified in the Connecticut River Fish Tissue Study Quality Assurance Project Plan (QAPP), April 6, 2000.

Please note that %RPD values reported in the table are calculated prior to rounding.



CT-BT-FC04					
Compound	MS % Rec. 30-130%	MSD % Rec. 30-130%	% RPD ≤40%	Action	
				Positive Detects	NDs
Hexachlorobenzene	NR	NR	NC	J	R
Oxychlorane	NR	6	NC	J	R
o, p'-DDE	4	5	17*	J	R
trans-Nonachlor	4	5	15*	J	R
o, p'-DDT	NR	NR	NC	J	R
cis-Nonachlor	5	6	14*	J	R
Endosulfan II	NR	4	NC	J	R
Endrin ketone	28	27	4*	J	UJ
Mirex	4	3	18*	J	R

NR Not recovered

NC Not calculated

\* Recoveries and/or RPDs were acceptable

CT2-SMB-FC01					
Compound	MS % Rec. 30-130%	MSD % Rec. 30-130%	% RPD ≤40%	Action	
				Positive Detects	NDs
Hexachlorobenzene	NR	NR	NC	J	R
Oxychlorane	NR	NR	NC	J	R
o, p'-DDE	2	NR	17*	J	R
trans-Nonachlor	NR	NR	NC	J	R
p, p'-DDE	56*	31*	57	J	UJ
o, p'-DDT	NR	NR	NC	J	R
cis-Nonachlor	16	13	25*	J	UJ
Endosulfan II	11	9	12*	J	R
Mirex	9	8	14*	J	R
PCB 153	73*	46*	47	J	UJ
PCB 206	132	111*	17*	J	A

NR Not recovered

NC Not calculated

\* Recoveries and/or RPDs were acceptable

CT3-SB-FI02					
Compound	MS % Rec. 30-130%	MSD % Rec. 30-130%	% RPD ≤40%	Action	
				Positive Detects	NDs
Hexachlorobenzene	NR	NR	NC	J	R
Oxychlorane	4	3	33*	J	R
o, p'-DDE	13	13	1*	J	UJ
trans-Nonachlor	NR	NR	NC	J	R
o, p'-DDD	200	207	3*	J	A
o, p'-DDT	NR	NR	NC	J	R

CT3-SB-FI02					
Compound	MS % Rec. 30-130%	MSD % Rec. 30-130%	% RPD ≤40%	Action	
				Positive Detects	NDs
Endosulfan sulfate	138	129*	6*	J	A
Mirex	14	15	11*	J	UJ
PCB 101 (dil)	114*	131	14*	J	A
PCB 187 (dil)	144	144	0*	J	A

NR Not recovered

NC Not calculated

\* Recoveries and/or RPDs were acceptable

(dil) Concentration reported from diluted analyses (1:5) since over calibration range in 1:1 analyses.

CT3-SB-FI03					
Compound	MS % Rec. 30-130%	MSD % Rec. 30-130%	% RPD ≤40%	Action	
				Positive Detects	NDs
Hexachlorobenzene	5	4	23*	J	R
Oxychlorodane	NR	NR	NC	J	R
o, p'-DDE	11	12	9*	J	UJ
trans-Nonachlor	NR	NR	NC	J	R
o, p'-DDD	241	260	8*	J	A
o, p'-DDT	NR	NR	NC	J	R
Endosulfan II	29	5	136	J	R
Mirex	15	17	9*	J	UJ
PCB 66	158	166	5*	J	A
PCB 105	122*	133	9*	J	A
PCB 187 (dil)	147	178	19*	J	A
PCB 180 (dil)	123*	174	34*	J	A

NR Not recovered

NC Not calculated

\* Recoveries and/or RPDs were acceptable

(dil) Concentration reported from diluted analyses (1:5) since over calibration range in 1:1 analyses.

CT4-SMB-FC04					
Compound	MS % Rec. 30-130%	MSD % Rec. 30-130%	% RPD ≤40%	Action	
				Positive Detects	NDs
Hexachlorobenzene	NR	NR	NC	J	R
Oxychlorodane	3	NR	NC	J	R
o, p'-DDE	NR	NR	NC	J	R
trans-Nonachlor	12	8	40*	J	R
o, p'-DDD	43*	22	63	J	UJ
o, p'-DDT	NR	NR	NC	J	R
cis-Nonachlor	12	8	38*	J	R
Endosulfan II	14	20	38*	J	UJ
Mirex	14	8	52	J	R

CT4-SMB-FC04					
Compound	MS % Rec. 30-130%	MSD % Rec. 30-130%	% RPD ≤40%	Action	
				Positive Detects	NDs
PCB 118	146	99*	39*	J	A

NR Not recovered

NC Not calculated

\* Recoveries and/or RPDs were acceptable

CT5-SMB-FC01					
Compound	MS % Rec. 30-130%	MSD % Rec. 30-130%	% RPD ≤40%	Action	
				Positive Detects	NDs
Hexachlorobenzene	NR	NR	NC	J	R
Oxychlorodane	2	NR	NC	J	R
o, p'-DDE	3	2	18*	J	R
trans-Nonachlor	NR	NR	NC	J	R
o, p'-DDD	18	16	10*	J	UJ
o, p'-DDT	NR	NR	NC	J	R
cis-Nonachlor	7	6	9*	J	R
Endosulfan II	2	2	10*	J	R
Mirex	2	7	99	J	R

NR Not recovered

NC Not calculated

\* Recoveries and/or RPDs were acceptable

CT7-SMB-FC04					
Compound	MS % Rec. 30-130%	MSD % Rec. 30-130%	% RPD ≤40%	Action	
				Positive Detects	NDs
Hexachlorobenzene	NR	NR	NC	J	R
Oxychlorodane	NR	NR	NC	J	R
o, p'-DDE	NR	NR	NC	J	R
trans-Nonachlor	NR	NR	NC	J	R
o, p'-DDD	340	321	6*	J	A
o, p'-DDT	NR	NR	NC	J	R
cis-Nonachlor	3	3	19*	J	R
Endosulfan II	12	14	13*	J	UJ
Mirex	3	3	19*	J	R

NR Not recovered

NC Not calculated

\* Recoveries and/or RPDs were acceptable

The following discussion summarizes the qualifications which were made based on the results of the seven sets of MS/MSD samples:

All endosulfan II and mirex results are non-detected and are rejected (R). All non-detected

hexachlorobenzene results are rejected (R) except for sample CT3-SB-FI02 which is estimated (J). All non-detected o,p'-DDE results are rejected (R) except for sample CT3-SB-FI04 which is estimated (J). Oxychlordan, trans-Nonachlor, o,p'-DDT, and cis-Nonachlor results in the samples are mixed with non-detects and positive detects. For these compounds, non-detects are rejected (R) and positive detects are estimated (J). All other affected compounds are qualified accordingly for the associated samples.

### **Compound Quantitation and Reported Quantitation Limits**

ERI's laboratory *SOP for Analysis of Pesticides and PCB Congeners in Tissue Samples* indicated acceptance criteria of  $\leq 25.0\%$  difference between two dissimilar columns. During validation it was found that this criteria was inconsistently applied. Therefore, professional judgement was used to estimate (J, UJ) all the compounds for all the samples due to this inconsistency.

Concentrations quantitated below the lowest calibration standard are flagged (J) on the Data Summary Tables. Quantitation is not accurate when results are reported below the lowest calibration standard.

Sample number CT3-SB-FI04 contains PCB 153 at a concentration above the instrument calibration range and is estimated (J). Quantitation is not accurate when the reported result is above the highest calibration standard.

The laboratory did not report quantitation limits for the non-detected results. The sample specific quantitation limits were calculated by the validator using the lowest calibration standard concentration (5.0 ng/mL) corrected for sample weight and volumes and reported on the Data Summary Table.

### **System Performance**

The laboratory was unable to recover the compounds hexachlorobenzene, oxychlordan, o,p'-DDE, trans-nonachlor, o,p'-DDT, cis-nonachlor, endosulfan II, and mirex in the matrix spike samples. All endosulfan II and mirex results are non-detected and are rejected (R). All non-detected hexachlorobenzene results are rejected (R) except for sample CT3-SB-FI02 which is estimated (J). All non-detected o,p'-DDE results are rejected (R) except for sample CT3-SB-FI04 which is estimated (J). Oxychlordan, trans-Nonachlor, o,p'-DDT, and cis-Nonachlor results in the samples are mixed with non-detects and positive detects. For these compounds, non-detects are rejected (R) and positive detects are estimated (J).

It is noted that the NIST/NOAA intercomparison exercise SRM was analyzed with some of the samples for this project but was not extracted along with any of them. The SRM was extracted some time before 9/29/00, which was the date the laboratory reported results to the NIST for evaluation, while the samples were extracted from 8/17/00 to 11/15/00. Inspection of the sample extraction logs do not show the SRM to be extracted with them. Therefore, the matrix spike

results are more accurate indicators of the laboratory's method performance.

Data validation identified the data quality issues which required qualification or rejection of specific results. The rejected (R) data cannot be used for the site objectives. The remaining data are qualified as estimated (J). Estimated data are often used in human health risk assessments. All the spiked surrogate compounds had percent recoveries within their acceptable ranges which supports the use of the J qualified data for the site objectives. Acceptable quality control results which support the use of the qualified data include holding times, available initial calibrations, continuing calibration verifications, and pesticide degradation checks. The majority of matrix spike compounds percent recoveries were within acceptable ranges and there were only minor exceedences in the continuing calibration verifications.

Very truly yours,

LOCKHEED MARTIN  
ENVIRONMENTAL

Leslie Chan  
Scientist

Louis Macri  
Team Manager

Attachments: Table I: Recommendation Summary Table  
Table II: Overall Evaluation of Data  
Data Summary Table  
Data Validation Worksheets  
Support Documentation  
Analytical Method  
Communications/Phone Logs  
Field Sampling Notes  
Workplan and QAPP

Table I  
Recommendation Summary Table for Pesticides/PCB Congeners  
Connecticut River Fish Tissue Study

Sample Nos.	CT-BT-FC01	CT-BT-FC02	CT-BT-FC03	CT-BT-FC04	CT-BT-FC05	CT1-SMB-FC01	CT1-SMB-FC02	CT1-SMB-FC03	CT1-SMB-FC04	CT1-SMB-FC05
alpha-BHC	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Hexachlorobenzene	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>
gamma-BHC	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
beta-BHC	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
delta-BHC	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Heptachlor	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Aldrin	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Oxychlorthane	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>
Heptachlor Epoxide	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
o, p'-DDE	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>
gamma-Chlordane	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
alpha-Chlordane	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Endosulfan I	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
trans-Nonachlor	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	J <sup>4,6</sup>	J <sup>4,6</sup>	J <sup>4,6</sup>	J <sup>4,6</sup>	J <sup>4,6</sup>
p, p'-DDE	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>
Dieldrin	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
o, p'-DDD	J <sup>4,5</sup>	J <sup>4,5</sup>	J <sup>4,5</sup>	J <sup>4,5</sup>	J <sup>4,5</sup>	J <sup>4,5</sup>	J <sup>4,5</sup>	J <sup>4,5</sup>	J <sup>4,5</sup>	J <sup>4,5</sup>
Endrin	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
o, p'-DDT	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	J <sup>4,6,7</sup>	R <sup>1</sup>	J <sup>4,6,7</sup>	J <sup>4,6,7</sup>	J <sup>4,6,7</sup>
cis-Nonachlor	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	J <sup>4,6</sup>	J <sup>4,6</sup>	J <sup>4,6</sup>	J <sup>4,6</sup>	J <sup>4,6</sup>
p, p'-DDD	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Endosulfan II	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>
Endrin Aldehyde	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
p, p'-DDT	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Endosulfan Sulfate	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Endrin Ketone	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4,5</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>

Table I  
Recommendation Summary Table for Pesticides/PCB Congeners  
Connecticut River Fish Tissue Study

Sample Nos.	CT-BT-FC01	CT-BT-FC02	CT-BT-FC03	CT-BT-FC04	CT-BT-FC05	CT1-SMB-FC01	CT1-SMB-FC02	CT1-SMB-FC03	CT1-SMB-FC04	CT1-SMB-FC05
Methoxychlor	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>
Mirex	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>
PCB 8	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 18	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 28	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 52	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>
PCB 44	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 66	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 101	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 77	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 118	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 153	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 105	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>
PCB 138	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>
PCB 187	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 126	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 128	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 180	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>
PCB 170	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 195	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>
PCB 206	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>
PCB 209	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>

Table I  
Recommendation Summary Table for Pesticides/PCB Congeners  
Connecticut River Fish Tissue Study

Sample Nos.	CT2-SMB-FC01	CT2-SMB-FC02	CT2-SMB-FC03	CT2-SMB-FC04	CT2-SMB-FC05	CT3-SB-FI01	CT3-SB-FI02	CT3-SB-FI03	CT3-SB-FI04
alpha-BHC	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Hexachlorobenzene	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	J <sup>1,4,6</sup>	R <sup>1</sup>	R <sup>1</sup>
gamma-BHC	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
beta-BHC	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
delta-BHC	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Heptachlor	J <sup>4</sup>	J <sup>4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Aldrin	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Oxychlordane	J <sup>4,6,7</sup>	J <sup>4,6,7</sup>	R <sup>1</sup>	R <sup>1</sup>	J <sup>4,6,7</sup>	J <sup>4,6,7</sup>	J <sup>4,6,7</sup>	J <sup>4,6,7</sup>	J <sup>4,6,7</sup>
Heptachlor Epoxide	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
o, p'-DDE	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	J <sup>4,6,7</sup>
gamma-Chlordane	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
alpha-Chlordane	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Endosulfan I	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
trans-Nonachlor	J <sup>4,6</sup>	J <sup>4,6</sup>	J <sup>4,6</sup>	J <sup>4,6</sup>	J <sup>4,6</sup>	J <sup>4,6</sup>	J <sup>4,6</sup>	J <sup>4,6</sup>	J <sup>4,6</sup>
p, p'-DDE	J <sup>4,5,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>
Dieldrin	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
o, p'-DDD	J <sup>4,5</sup>	J <sup>4,5</sup>	J <sup>4,5</sup>	J <sup>4,5</sup>	J <sup>4,5</sup>	J <sup>4,5</sup>	J <sup>4,5</sup>	J <sup>4,5</sup>	J <sup>4,5</sup>
Endrin	J <sup>4</sup>	J <sup>4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
o, p'-DDT	J <sup>4,6,7</sup>	J <sup>4,6,7</sup>	J <sup>4,6,7</sup>	J <sup>4,6,7</sup>	R <sup>1</sup>	R <sup>1</sup>	J <sup>4,6,7</sup>	J <sup>4,6,7</sup>	J <sup>4,6,7</sup>
cis-Nonachlor	J <sup>4,6</sup>	J <sup>4,6</sup>	J <sup>4,6</sup>	J <sup>4,6</sup>	J <sup>4,6</sup>	J <sup>4,6</sup>	J <sup>4,6</sup>	J <sup>4,6</sup>	J <sup>4,6</sup>
p, p'-DDD	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Endosulfan II	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>
Endrin Aldehyde	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
p, p'-DDT	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Endosulfan Sulfate	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Endrin Ketone	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>



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Sample Nos.	CT2-SMB-FC01	CT2-SMB-FC02	CT2-SMB-FC03	CT2-SMB-FC04	CT2-SMB-FC05	CT3-SB-FI01	CT3-SB-FI02	CT3-SB-FI03	CT3-SB-FI04
Methoxychlor	J <sup>4</sup>	J <sup>4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Mirex	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>
PCB 8	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 18	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 28	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 52	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>
PCB 44	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 66	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4,5</sup>	J <sup>4</sup>
PCB 101	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4,5</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 77	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 118	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 153	J <sup>4,5</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>2,4</sup>
PCB 105	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4,5</sup>	J <sup>1,4</sup>
PCB 138	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>
PCB 187	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4,5</sup>	J <sup>4,5</sup>	J <sup>4</sup>
PCB 126	J <sup>4</sup>	J <sup>4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 128	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 180	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,5,7</sup>	J <sup>4,7</sup>
PCB 170	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 195	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>
PCB 206	J <sup>4,5,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>
PCB 209	J <sup>4</sup>	J <sup>4</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>

Table I  
Recommendation Summary Table for Pesticides/PCB Congeners  
Connecticut River Fish Tissue Study

Sample Nos.	CT3-SMB-FC01	CT3-SMB-FC02	CT3-SMB-FC03	CT3-SMB-FC04	CT3-SMB-FC05	CT4-SMB-FC01	CT4-SMB-FC02	CT4-SMB-FC03	CT4-SMB-FC04	CT4-SMB-FC05
alpha-BHC	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Hexachlorobenzene	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>
gamma-BHC	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
beta-BHC	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
delta-BHC	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Heptachlor	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Aldrin	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Oxychlordane	J <sup>4,6,7</sup>	J <sup>4,6,7</sup>	R <sup>1</sup>	J <sup>4,6,7</sup>	J <sup>4,6,7</sup>	R <sup>1</sup>	J <sup>4,6,7</sup>	R <sup>1</sup>	R <sup>1</sup>	J <sup>4,6,7</sup>
Heptachlor Epoxide	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
o, p'-DDE	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>
gamma-Chlordane	J <sup>4</sup>	J <sup>4</sup>	J <sup>3,4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
alpha-Chlordane	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Endosulfan I	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
trans-Nonachlor	J <sup>4,6</sup>	J <sup>4,6</sup>	J <sup>4,6</sup>	J <sup>4,6</sup>	J <sup>4,6</sup>	J <sup>4,6</sup>	J <sup>4,6</sup>	R <sup>1</sup>	R <sup>1</sup>	J <sup>4,6</sup>
p, p'-DDE	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>
Dieldrin	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
o, p'-DDD	J <sup>3,4,5</sup>	J <sup>3,4,5</sup>	J <sup>4,5</sup>	J <sup>3,4,5</sup>	J <sup>3,4,5</sup>	J <sup>4,5</sup>	J <sup>4,5</sup>	J <sup>4,5</sup>	J <sup>4,5</sup>	J <sup>4,5</sup>
Endrin	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
o, p'-DDT	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>
cis-Nonachlor	J <sup>4,6</sup>	J <sup>4,6</sup>	J <sup>4,6</sup>	J <sup>4,6</sup>	J <sup>4,6</sup>	R <sup>1</sup>	R <sup>1</sup>	J <sup>4,6</sup>	R <sup>1</sup>	R <sup>1</sup>
p, p'-DDD	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Endosulfan II	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>
Endrin Aldehyde	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
p, p'-DDT	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>
Endosulfan Sulfate	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Endrin Ketone	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>

Table I  
Recommendation Summary Table for Pesticides/PCB Congeners  
Connecticut River Fish Tissue Study

Sample Nos.	CT3-SMB-FC01	CT3-SMB-FC02	CT3-SMB-FC03	CT3-SMB-FC04	CT3-SMB-FC05	CT4-SMB-FC01	CT4-SMB-FC02	CT4-SMB-FC03	CT4-SMB-FC04	CT4-SMB-FC05
Methoxychlor	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Mirex	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>
PCB 8	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 18	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 28	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 52	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>
PCB 44	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 66	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 101	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 77	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 118	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4,5</sup>	J <sup>4</sup>
PCB 153	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 105	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>
PCB 138	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>
PCB 187	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 126	J <sup>4</sup>	J <sup>4</sup>	J <sup>3,4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 128	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 180	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>
PCB 170	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 195	J <sup>1,3,4</sup>	J <sup>1,3,4</sup>	J <sup>1,4</sup>	J <sup>1,3,4</sup>	J <sup>1,3,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>
PCB 206	J <sup>4</sup>	J <sup>4</sup>	J <sup>4,7</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4</sup>	J <sup>4,7</sup>
PCB 209	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>

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Recommendation Summary Table for Pesticides/PCB Congeners  
Connecticut River Fish Tissue Study

Sample Nos.	CT5-SMB-FC01	CT5-SMB-FC02	CT5-SMB-FC03	CT5-SMB-FC04	CT5-SMB-FC05	CT6-SMB-FC01	CT6-SMB-FC02	CT6-SMB-FC03	CT6-SMB-FC04	CT6-SMB-FC05
alpha-BHC	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Hexachlorobenzene	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>
gamma-BHC	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
beta-BHC	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
delta-BHC	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Heptachlor	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Aldrin	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Oxychlordane	R <sup>1</sup>	J <sup>4,6,7</sup>	R <sup>1</sup>	R <sup>1</sup>	J <sup>4,6,7</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	J <sup>4,6,7</sup>
Heptachlor Epoxide	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
o, p'-DDE	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>
gamma-Chlordane	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
alpha-Chlordane	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Endosulfan I	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
trans-Nonachlor	J <sup>4,6</sup>	R <sup>1</sup>	J <sup>4,6</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	J <sup>4,6</sup>	R <sup>1</sup>	R <sup>1</sup>
p, p'-DDE	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>
Dieldrin	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
o, p'-DDD	J <sup>4,5</sup>	J <sup>4,5</sup>	J <sup>4,5</sup>	J <sup>4,5</sup>	J <sup>4,5</sup>	J <sup>4,5</sup>	J <sup>4,5</sup>	J <sup>4,5</sup>	J <sup>4,5</sup>	J <sup>4,5</sup>
Endrin	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
o, p'-DDT	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>
cis-Nonachlor	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>
p, p'-DDD	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Endosulfan II	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>
Endrin Aldehyde	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
p, p'-DDT	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Endosulfan Sulfate	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Endrin Ketone	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>

Table I  
Recommendation Summary Table for Pesticides/PCB Congeners  
Connecticut River Fish Tissue Study

Sample Nos.	CT5-SMB-FC01	CT5-SMB-FC02	CT5-SMB-FC03	CT5-SMB-FC04	CT5-SMB-FC05	CT6-SMB-FC01	CT6-SMB-FC02	CT6-SMB-FC03	CT6-SMB-FC04	CT6-SMB-FC05
Methoxychlor	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Mirex	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>
PCB 8	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 18	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 28	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 52	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>
PCB 44	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 66	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 101	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 77	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 118	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 153	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 105	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>
PCB 138	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>
PCB 187	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 126	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 128	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 180	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>
PCB 170	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 195	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>
PCB 206	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4,7</sup>
PCB 209	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>

Table I  
Recommendation Summary Table for Pesticides/PCB Congeners  
Connecticut River Fish Tissue Study

Sample Nos.	CT7-SMB-FC01	CT7-SMB-FC02	CT7-SMB-FC03	CT7-SMB-FC04	CT7-SMB-FC05
alpha-BHC	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Hexachlorobenzene	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>
gamma-BHC	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
beta-BHC	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
delta-BHC	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Heptachlor	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>4</sup>	J <sup>3,4</sup>
Aldrin	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Oxychlordane	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>
Heptachlor Epoxide	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
o, p'-DDE	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>
gamma-Chlordane	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
alpha-Chlordane	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Endosulfan I	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
trans-Nonachlor	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	J <sup>4,6</sup>	R <sup>1</sup>
p, p'-DDE	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>
Dieldrin	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
o, p'-DDD	J <sup>4,5</sup>	J <sup>4,5</sup>	J <sup>4,5</sup>	J <sup>4,5</sup>	J <sup>4,5</sup>
Endrin	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>4</sup>	J <sup>3,4</sup>
o, p'-DDT	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>
cis-Nonachlor	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>
p, p'-DDD	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Endosulfan II	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>
Endrin Aldehyde	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>3,4</sup>	J <sup>4</sup>
p, p'-DDT	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>4</sup>	J <sup>3,4</sup>
Endosulfan Sulfate	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
Endrin Ketone	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>

Table I  
Recommendation Summary Table for Pesticides/PCB Congeners  
Connecticut River Fish Tissue Study

Sample Nos.	CT7-SMB- FC01	CT7-SMB- FC02	CT7-SMB- FC03	CT7-SMB- FC04	CT7-SMB- FC05
Methoxychlor	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>4</sup>	J <sup>3,4</sup>
Mirex	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>	R <sup>1</sup>
PCB 8	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 18	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 28	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 52	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>
PCB 44	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 66	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 101	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 77	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 118	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 153	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 105	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>
PCB 138	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>
PCB 187	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 126	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>3,4</sup>	J <sup>4</sup>	J <sup>3,4</sup>
PCB 128	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 180	J <sup>4</sup>	J <sup>4,7</sup>	J <sup>4</sup>	J <sup>4,7</sup>	J <sup>4,7</sup>
PCB 170	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 195	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>	J <sup>1,4</sup>
PCB 206	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>
PCB 209	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>	J <sup>4</sup>

Table I  
Recommendation Summary Table for Pesticide/PCB Congeners

A	-	Accept results.
J <sup>1</sup>	-	SRM compound outside lower QC limits; J detects, UJ non-detects.
J <sup>2</sup>	-	Compound concentration outside instrument calibration range; J detect.
J <sup>3</sup>	-	Continuing calibration verification % recovery outside criterion: J detects, UJ non-detects.
J <sup>4</sup>	-	Analyte identification criterion (>25%D between columns) inconsistently applied by laboratory: J detects, UJ non-detects.
J <sup>5</sup>	-	MS/MSD recoveries and/or RPD outside criteria: J detects, UJ non-detects.
J <sup>6</sup>	-	MS not recovered or <10% recovery: J detects.
J <sup>7</sup>	-	SRM compound outside upper QC limits; J detects.
R <sup>1</sup>	-	MS not recovered or <10% recovery; R non-detects.



## Overall Evaluation of Data - Data Validation Memorandum - Table II

PESTICIDES/PCB CONGENERS					
DQO (list all DQOs)	Sampling* and/or Analytical Method Appropriate Yes or No	Measurement Error		Sampling Vari- ability	Potential Usability Issues
		Analytical Error	Sampling Error		
To perform a watershed-wide fish tissue monitoring program which will document current conditions with regard to contaminant concentrations of representative fish species from the mainstem of the Connecticut River. This information will enable states to revise human health risk assessments and will provide a basis for trend analysis when subsequent sampling is performed by monitoring teams.	Yes, Sampling Method appropriate for all samples.  Yes, Analytical Method appropriate for all samples.	Refer to quali- fication in R/S Key on Table I  J <sup>1,2,3,4,5,6,7</sup> , R <sup>1</sup>	Refer to quali- fication in R/S Key on Table I  None	**	<p>One Standard Reference Material sample (SRM 1945 "Organics in Whale Blubber") obtained from NOAA/NMFS NIST (intercomparison exercise) was analyzed for this project. Sixteen out of the 30 spiked compounds with certified values had recoveries within established acceptance limits. For the compounds that are outside QC limits, five (hexachlorobenzene, PCB 52, PCB 105, PCB 138, PCB 195) were recovered outside the lower limit and nine (o,p'-DDT, o,p'-DDE, p,p'-DDE, o,p'-DDD, oxychlordane, mirex, PCB 180, PCB 206, PCB 209) were recovered above the upper limit. The analytes that do not meet criteria are qualified accordingly for all samples.</p> <p>The five rinsate blanks sampled on 8/7/00, 10/23/00, and 11/1/00 are not validated since associated raw data for the rinsate blanks and supporting laboratory benchsheet documentation were not supplied by the laboratory.</p> <p>The laboratory was unable to recover the compounds hexachlorobenzene, oxychlordane, o,p'-DDE, trans-nonachlor, o,p'-DDT, cis-nonachlor, endosulfan II, and mirex in the matrix spike samples. All endosulfan II and mirex results are non-detected and are rejected (R). All non-detected hexachlorobenzene results are rejected (R) except for sample CT3-SB-FI02 which is estimated (J). All non-detected o,p'-DDE results are rejected (R) except for sample CT3-SB-FI04 which is estimated (J). Oxychlordane, trans-Nonachlor, o,p'-DDT, and cis-Nonachlor results in the samples are mixed with non-detects and positive detects. For these compounds, non-detects are rejected (R) and positive detects are estimated (J).</p> <p>Data validation identified the data quality issues which required qualification or rejection of specific results. The rejected (R) data cannot be used for the site objectives. The remaining data are qualified as estimated (J). Estimated data are often used in human health risk assessments. All the spiked surrogate compounds had percent recoveries within their acceptable ranges which supports the use of the J qualified data for the site objectives. Acceptable quality control results which support the use of the qualified data include holding times, available initial calibrations, continuing calibration verifications, and pesticide degradation checks. The majority of matrix spike compounds percent recoveries were within acceptable ranges and there were only minor exceedences in the continuing calibration verifications.</p>

\* The evaluation of "sampling error" cannot be completely assessed in the data validation.

\*\* Sampling variability is not assessed in data validation.

Validator: \_\_\_\_\_

Date: \_\_\_\_\_